

WHAT IS CLAIMED IS:

1. A perpendicular magnetic recording medium, comprising:
a non-magnetic substrate;
an anti-ferromagnetic layer on said non-magnetic substrate;
5 said anti-ferromagnetic layer including a Mn alloy containing at least
Co at 10 atomic % or greater and 50 atomic % or less;
a soft magnetic layer on said anti-ferromagnetic layer; and
a magnetic recording layer on said soft magnetic layer.
2. A perpendicular magnetic recording medium according to claim 1,
10 further comprising a protective layer on said magnetic recording layer.
3. A perpendicular magnetic recording medium according to claim 2,
further comprising liquid lubricant layer on said protective layer.
4. A perpendicular magnetic recording medium comprising:
a nonmagnetic substrate;
15 an anti-ferromagnetic layer on said non-magnetic substrate;
said non-ferromagnetic layer including a Mn alloy containing at least Ir
at 10 atomic % or greater and 30 atomic % or less;
a soft magnetic layer on said anti-ferromagnetic layer; and
a hard magnetic layer on said soft magnetic layer.
- 20 5. A perpendicular magnetic recording medium according to claim 4,
further comprising a protective layer on said hard magnetic layer.
6. A perpendicular magnetic recording medium according to claim 5,
further comprising a liquid lubricant layer on said protective layer.
7. A perpendicular magnetic recording medium as described in Claim
25 1, wherein said soft magnetic layer is an amorphous alloy containing Co.

8. A perpendicular magnetic recording medium according to claim 4 wherein said soft magnetic layer is an amorphous alloy containing Co.

9. A manufacturing method for a perpendicular magnetic recording medium, comprising:

- 5 forming an anti-ferromagnetic layer on a non-magnetic substrate;
- forming a soft magnetic layer on said anti-ferromagnetic layer;
- forming a magnetic recording layer on said soft magnetic layer;
- forming a protective layer on said magnetic recording layer;
- forming a liquid lubricant layer on said protective layer;

10 said anti-ferromagnetic layer is an Mn alloy containing at least Co at 10 atomic % or greater and 50 atomic % or less;

 during film formation of at least said anti-ferromagnetic layer and said soft magnetic layer, applying a magnetic field of 796 A/m (10 Oe) or greater that is parallel to a radial direction of said non-magnetic substrate.

15 10. A manufacturing method for a perpendicular magnetic recording medium comprising:

- forming an anti-ferromagnetic layer on a non-magnetic substrate;
- forming a soft magnetic layer on said anti-ferromagnetic layer;
- forming a magnetic recording layer on said soft magnetic layer;
- 20 forming a protective layer on said magnetic recording layer;
- forming a liquid lubricant layer on said protective layer;

 said anti-ferromagnetic layer is an Mn alloy containing at least Ir at 10 atomic % or greater and 30 atomic % or less;

25 during film formation of at least said anti-ferromagnetic layer and said soft magnetic layer, applying a magnetic field of 796 A/m (10 Oe) or greater that is parallel to a radial direction of said non-magnetic substrate.

11. A manufacturing method for a perpendicular magnetic recording medium as described in Claim 9, wherein said soft magnetic layer is an amorphous alloy containing Co.

5 12. A manufacturing method for a perpendicular magnetic recording medium as described in Claim 10, wherein said soft magnetic layer is an amorphous alloy containing Co.